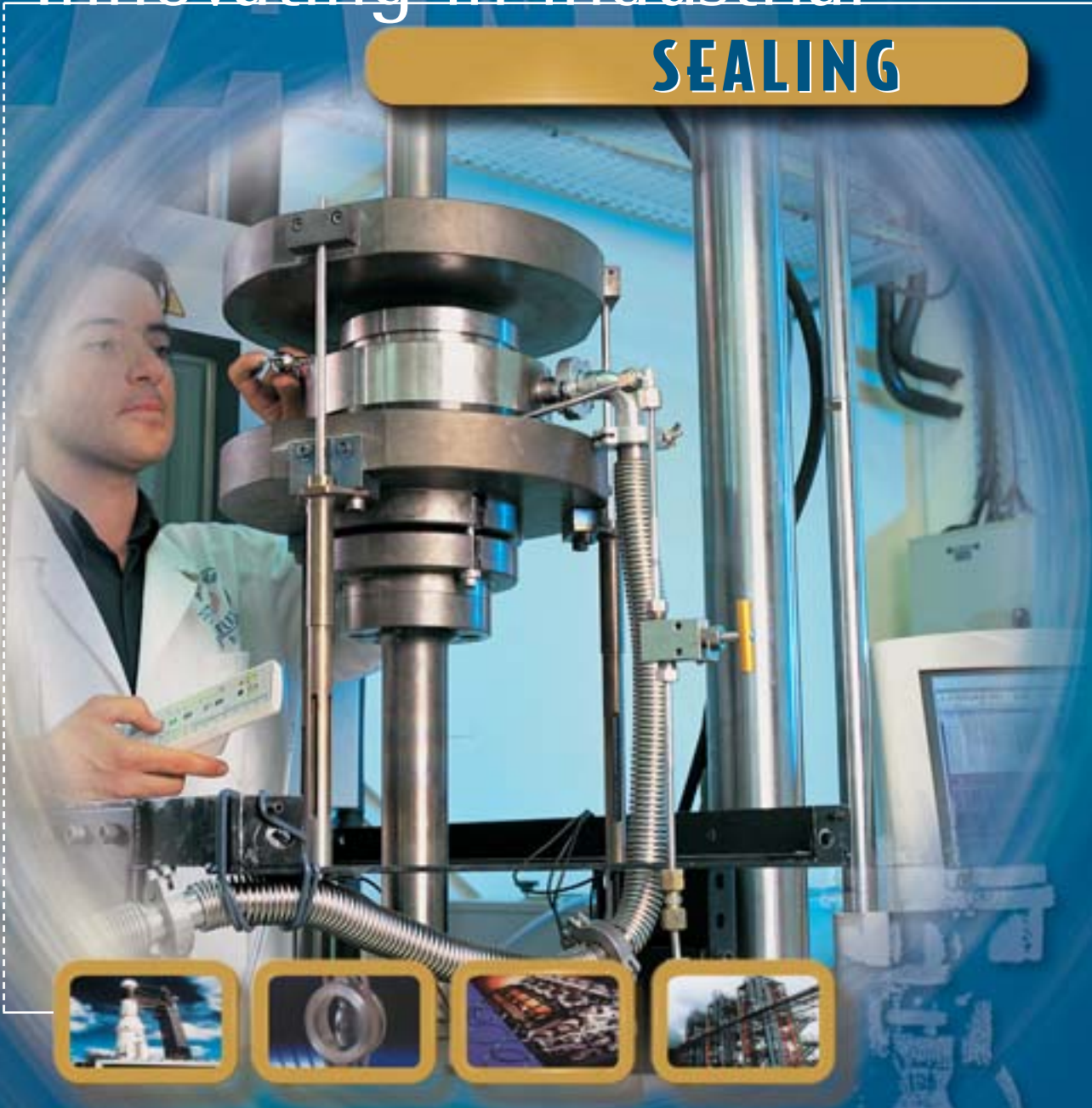


# Innovating in industrial

## SEALING



CEA Valrhô

CEFILAC

Garlock  
Sealing Technologies



## A different approach

### THE CEA / CEFILAC COLLABORATION

A Research and Development Center dedicated to Sealing Technology is jointly operated by CEFILAC (An affiliate of Garlock Sealing Technologies, part of BF Goodrich group), worldwide leader in High Performance Sealing, and CEA (Commissariat à l'Energie Atomique), expert in advanced technologies.



High performance valves



Uranium enrichment plant (EURODIF)



Micro-chip manufacturing equipment

## Sharing

### EXPERIENCE AND KNOW-HOW

As early as 1970, CEA started working on the development of high performance sealing systems for its own requirements in the then fairly new field of the nuclear industry.

CEFILAC, involved at the early stage of this development work, was then able to extrapolate further and use the acquired know-how for applications in other industrial fields.

Such collaboration naturally led to both parties pooling their strengths and know-how and creating a unique environment based on innovation capabilities and technical expertise in industrial sealing.

Aerospace Industry (Ariane V)



Nuclear fusion reactor



Chemical and Petrochemical Industries



High performance machinery (Formula 1 engine)

# Capabilities

## IN MATERIAL AND PRODUCT ANALYSIS



Microscope and digital camera for seal surface and cross-sectional analysis



Scanning electron microscope



Optical microscope with video screen

# Capabilities

## IN SEAL AND GASKET TESTING

In addition to standard test equipment typically found in a Sealing Laboratory : computer-controlled presses, temperature chambers, helium mass-spectrometers..., specific equipment have been developed :

- Gas booster for very high pressures (up to 1400 bar helium [20000 psi]).
- Test stands for testing of complete assemblies at extreme temperature conditions (-196°C to 1100°C [-320F to 2010F]).
- Mock-ups for evaluating seating stress relaxation over very long periods of time (up to and beyond 50000 hours).
- Test stands for development of valve seats at pressure and temperature combined (poppet valves, ball-valves).
- Rising-stem, 1/4-turn and rotary shaft test stands for characterization of valve and pump packings.
- Specific test fixtures for determination of gasket parameters as per the latest prEN13555 et PVRC/ROTT procedures.
- Test stands for dynamic testing of mechanical seals with shaft diameters up to 200mm.
- Test platform for large size and/or heavy mock-ups (up to 5 tons)



Test stands for cycling at pressure and temperature : valve rising stems and 1/4-turn stems, and poppet valve seats

# technological Offer

Services offered go from basic mechanical and performance characterization test to development around the SEALING function of more complex systems, which may include verification on mock-ups under real conditions, construction of specific test stands, etc...



Test stand for large-size mechanical seals (up to 200mm shaft)



Endurance test stand for ball-valves



Heated platens for seal characterization at temperature

# Customer specific

## TEST PLATFORMS

Some of the specific platforms developed for Cefilac customers



Test platform for development of a customer-specific rotary shaft sealing system



Testing of super-light flanges for aerospace application (800°C - 200 bar Helium)



Testing of 820mm piston seal in graphite material (800°C, slow-motion)



Test platform for checking behaviour of Light Water Reactor vessel seal against flange surface defects

## STATIC SEALING

## SEMI-STATIC SEALING

## DYNAMIC SEALING

